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ABSTRACT

Many factors influence the grades students earn. Without the intervention of institutional forces, it is reasonable to suspect that the mean semester index of successful students will remain constant with the passage of time. If, on the other hand, institutional variables exist that influence grading standards, then it is reasonable to suspect that the mean semester indices will reflect systematic change. The academic records of seventy-nine students who began their academic careers at the State University College at Oswego and remained in attendance and in good standing for seven consecutive semesters were selected for this study. The mean semester index of the subjects showed an increase between the freshmen and sophomore, sophomore and junior, junior and senior years. The semester indices of these students were below the general mean in the freshmen year and above the mean in the last semester of the senior year. Since there was no reason to suspect that these students experienced large relative gains in intelligence or talent, it must be concluded that the cause of these gains was external and probably institutionally based. (Author/KE)

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Semester Indices of Successful Students as a Function of the Semester in Attendance

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Abstract

The academic records of seventy-nine students who began their academic careers at the State University College at Oswego and remained in attendance and in good standing for seven consecutive semesters were selected for this study. The mean semester index of the subjects showed an increase between the freshmen and sophomore, sophomore and junior, and junior and senior years. The semester indices of these students were below the general mean in the freshmen year and above the general mean in the last semesters of the junior and first semester of the senior year. A function relating the mean semester index to the semester in attendance was developed.

Semester Indices of Successful Students
as a Function of the Semester in Attendance

Recently there have been a number of articles and a great deal of informal discussion about the problem of grade inflation in colleges and universities. A number of people have suggested that grading standards have become less stringent in recent years with the result that students who in the past would have earned "C's" are now earning "B's" and students who would have earned "B's" are earning academic honors. The pitfall of this sort of speculation is that there are many factors, institutional and personal, which influence the grades students earn. Is the quality of students improving? Has the quality of instruction improved to an extent that "C" students are now learning enough to be "B" students? Are there institutional factors at work which tend to increase grades without a corresponding increase in achievement?

There are so many imponderables in the broad question that it is difficult to establish the existence or the cause of general academic inflation, yet the problem need not be stated this broadly. Think for a moment of a single successful student. By successful we mean that this student begins his/her academic career and continues it without interruption through graduation meeting the academic and disciplinary standards of the College without catastrophic personal difficulties which would necessitate a leave of absence or withdrawal. As the student progresses, it is reasonable to suspect that on the whole his/her grade-point average at the end of each semester would remain constant. After all, the student is not becoming more intelligent with the passage of time and, while he/she is learning how to cope more successfully with the academic environment, so are other students. In fact, as less capable students leave the institution and competition increases, it would even be possible that the successful student's semester indices would reflect a steady decrease in spite of

constant or increased accomplishment.

Obviously, few students will follow this pattern, some will show increases while others will show decreases, and still others will show sporadic patterns of increase and decrease. Yet, without the intervention of institutional forces, it is reasonable to suspect that the mean semester index of successful students will remain constant with the passage of time. If, on the other hand, institutional variables exist which influence grading standards, then it is reasonable to suspect that the mean semester indices will reflect systematic change.

Method

In order to test the hypotheses of constant semester indices, the academic records of seventy-nine successful students at the State University College at Oswego were randomly selected from the official records of the College. To be selected, a student must have completed seven uninterrupted semesters through the fall of 1974. Thus, students who had left the College and returned, who had begun their careers elsewhere, or who had completed academic work at another institution were not included; only the records of those students who had entered and had begun their career at the State University College at Oswego and who had made progress toward their degree were included. The indices for each of the seven semesters in attendance constituted the variables used in this study.

Since semester indices are likely to be intercorrelated, the usual univariate repeated measures design is an appropriate method of analysis since it is based on the assumption of no correlation or constant correlation. Thus, the multivariate repeated measures design based on the suggestion of Morrison (1967) was selected. Two specific hypotheses were tested:

1. There was no difference between the mean semester's index of successful students.
2. There was no difference between successive semesters' indices of successful students.

Table 1 presents the means and standard deviations of the semester indices both in terms of their actual values and in terms of the grand mean semester index

Insert Table 1 About Here

for all subjects across semesters which was 2.971; the intercorrelations of these indices are presented in Table 2.

Insert Table 2 About Here

The first hypotheses was tested by means of multivariate test of the deviation of the mean semester index; thus, the null hypothesis was that the mean deviation for each semester was zero. Table 3 indicates that this hypothesis was rejected

Insert Table 3 About Here

($p<0.001$). In light of this rejection, it was possible to conduct univariate tests on the mean deviation of each semester. The deviations in semesters 1, 2, 6, and 7 were significantly different from zero. Inspection of the deviations themselves indicates that the mean semester index in each of the first two semesters of college were significantly lower than the grand mean and semesters 6 and 7 were significantly higher.

In order to further explore these differences, the second hypothesis was tested. In this case, the differences between successive semester indices was computed for each subject. In other words, the semester index for the first semester was subtracted from the semester index for the second semester, the index for the second semester was subtracted from the index for the third semester, etc. The hypothesis tested was that the mean difference between successive semesters was zero. (Table 4)

TABLE 1

Mean, Standard Deviations of Actual Semester Indices from the Grand Mean of Semester Indices for Forty-nine Successful Students

Semester	Actual Index	Deviation Index	Standard Deviation*
1	2.700	-0.271	0.545
2	2.788	-0.193	0.651
3	2.913	-0.058	0.575
4	2.919	-0.052	0.599
5	3.078	0.106	0.665
6	3.123	0.151	0.581
7	3.289	0.317	0.507

*Since only the mean of the distribution was changed, the standard deviation will be the same in both instances.

Table 2

Intercorrelations of Semester Indices by Semester*

Semester	1	2	3	4	5	6	7
1	100						
2	69	100					
3	46	54	100				
4	39	50	63	100			
5	42	49	50	62	100		
6	33	43	58	65	74	100	
7	26	45	39	44	63	56	100

*Decimals omitted throughout

TABLE 3

Multivariate Test of the Hypothesis that Semester Indices do not deviate from the Grand Mean

Test of Roots	F	df Hyp	df Error	p
1 through 1	10.369	7	72	<0.001

Univariate Tests of Significance

Variable	F(1,78)	MS	p
Semester 1	19.657	5.833	<0.001***
Semester 2	7.010	2.968	0.009**
Semester 3	0.824	0.272	0.366
Semester 4	0.616	0.220	0.434
Semester 5	2.024	0.893	0.158
Semester 6	5.379	1.816	0.022*
Semester 7	31.109	7.974	<0.001***

*p<0.05

**p<0.01

***p<0.001

This hypothesis was rejected ($p<0.001$) (Table 5). An inspection of the univariate

Insert Tables 4 and 5 About Here

tests of significance indicates that there was a significant increase in the semester index between the second and third semester ($p = 0.046$), fourth and fifth semesters ($p = 0.012$), and sixth and seventh semesters ($p = 0.005$).

The rejection of these two hypotheses demonstrated that within this particular population of students, the indices of freshmen are lower than the grades of second semester juniors and seniors and that successful students do experience significant increases in their semester index between their freshmen, sophomore, junior, and senior years.

Since the pattern was one of continual but not constant increase, it was reasonable to attempt to isolate a function which would relate the semester in attendance to the semester index. By applying a curve fitting procedure suggested by Ostle (19.4), a cubic equation was derived to most effectively explain the relationship:

$$SI = 0.002S^3 - 0.0023S^2 + 0.157S - 0.412$$

where SI is equal to the deviation of the semesters indices from the grand mean and S equaled semesters. This function and the actual deviations from it are presented in Figure 1.

Insert Figure 1 About Here

Discussion

This population of unusually successful and stable students experienced a continual increase in their semester indices as they progressed through college. This increase was particularly noticeable at the juncture between their freshmen

TABLE 4

Means and Standard Deviations of the Differences Between Semester Indices in Successive Semesters

Difference between Indices in Semesters	Mean	Standard Deviation
1 and 2	0.077	0.479
2 and 3	0.135	0.593
3 and 4	0.005	0.507
4 and 5	0.159	0.551
5 and 6	0.045	0.456
6 and 7	0.166	0.517

TABLE 5

Multivariate Test of the Hypothesis that the Differences between Successive Semesters are Zero

Test of Roots	F	df Hyp	df Error	p
1 through 1	12.022	6	73	<0.001

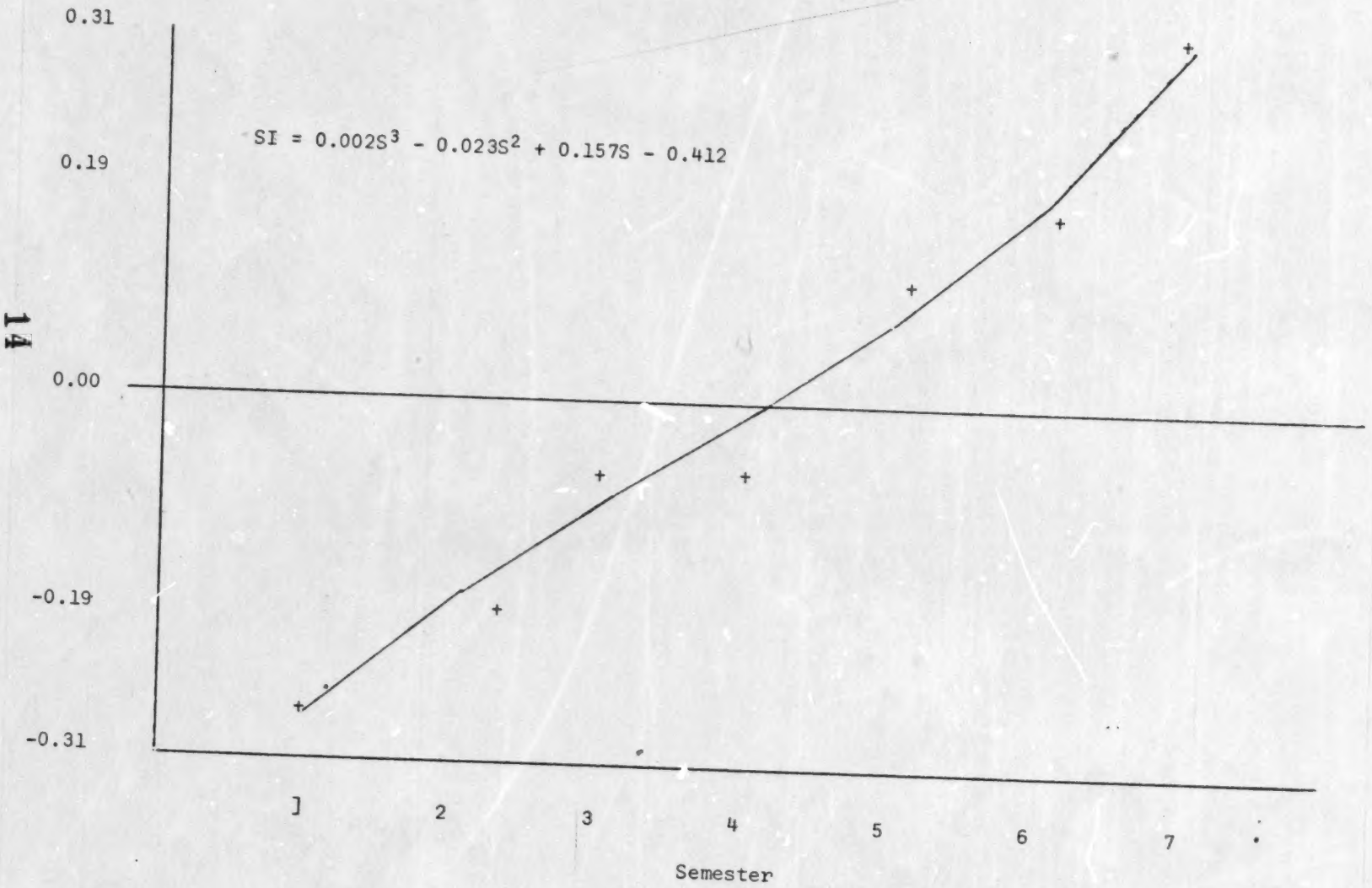
Univariate Tests of Significance

Difference between Semester	F(1,78)	MS	p
1 and 2	2.087	0.780	0.152
2 and 3	4.104	1.443	0.046*
3 and 4	0.010	0.002	0.919
4 and 5	6.594	2.006	0.012*
5 and 6	0.779	0.162	0.379
6 and 7	8.154	2.182	0.005**

*p<0.05
**p<0.01

FIGURE 1

Theoretical Distribution of Mean Semester Indices Around the Grand Mean with Actual Values



and sophomore, sophomore and junior, and junior and senior years. Since there was no reason to suspect that these students experienced large relative gains in either intelligence or talent, it must be concluded that the cuase of these gains was external and probably institutionally based. Whether or not these causes are rational or consistent with the educational philosophy of the institution is not known; however, the general influences do exist. These institutional forces should be examined in light of their consistency with the educational goals and philosophy of the institution. Perhaps it is reasonable for students to make these gains, perhaps the gains act to provide motivation and incentive; on the other hand, they may have the effect of "cost of living increases" bearing little relationship to productivity and simply increasing the overall grade-point necessary to remain competitive with other students as they seek academic honors, further education, and employment; a reasonable definition of "academic inflation."

References

Morrison, D. F., Multivariate Statistical Methods. New York: McGraw-Hill, 1967.

Ostle, B., Statistics in Research. The Iowa State College Press, 1954, Chapt. 6.